Surficial deposits in the Franklin quadrangle consist of glacial and postglacial sediments. The glacial sediments include sand, gravel, silt, and clay laid down in glacial lakes and river plains; and till laid down by glacial ice as a discon tinuous sheet on bedrock, in moraines and other areas of hummocky topography, and in drumlins. The sand, gravel, silt, and clay, known collectively as stratified deposits, are as much as 150 feet thick. Till is as much as 100 feet thick. The postglacial sediments include sand, gravel, and silt deposited in floodplains, stream terraces, and alluvial fans; peat, silt, and clay deposited in swamps; and talus deposited at the base of cliffs. They are generally less than

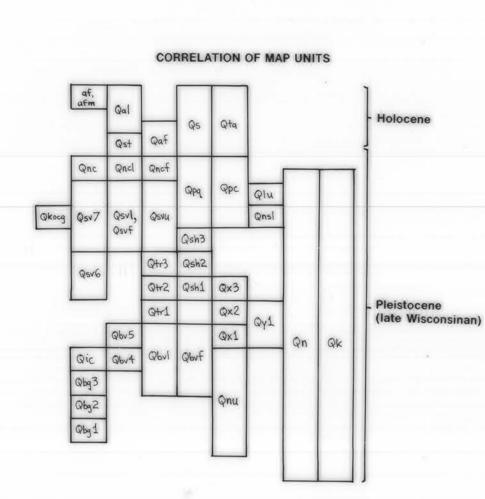
These deposits are delineated on the accompanying map and sections and are described below. Water well logs used to construct bedrock-surface contours and to infer the subsurface distribution of the deposits are provided in table 1. The temporal relationships of the deposits are shown on the correlation chart. Recessional ice margins and associated deposits are shown in figure 1.

The bedrock geology is described in Buddington and Baker (1961) and Her-

The stratified glacial deposits are divided into units that represent the individual glacial-lake basin or glacial-stream valley in which they were laid down. Within a given basin or valley, numbers on the map units indicate successively lower lakes or lake stages that formed as the ice front retreated. In the case of glacial-stream deposits, or of combined glacial-lake and glacial-stream deposits (such as the Berkshire Valley units), the numbers indicate sediments laid down from successively-younger ice-margin positions. Some of the glacial-lake deposits, such as lake-bottom and lacustrine-fan sediments and some small deltaiunits, are not assigned to specific lake stages. Likewise, some of the glacialstream deposits cannot be correlated to specific ice-margin positions, and so are not numbered. For each stratified map unit, basic texture and thickness information is provided in the unit description. Bedding, color, and sand and gravel composition are similar for all the stratified units and are described in the gen-

Till is subdivided into two basic units based on color, grain-size, and gravelclast lithology. Morphologic varieties of these tills such as moraines are mapped as subunits of the two basic units.

eral headings for glacial-lake and glacial-stream deposits.



DESCRIPTION OF MAP UNITS Postglacial Deposits--Man-made fill and natural sediment deposited along streams, in wetlands, and at the base of cliffs. These deposits have been accu-

mulating since retreat of the late Wisconsinan glacier. ARTIFICIAL FILL--Excavated till, sand, gravel, and rock; and construction debris, cinders, slag, and trash. In highway and railroad embankments, dams, landfills, and filled land. As much as 60 feet thick, but generally less than 20 feet thick.

MINE AND QUARRY TAILINGS--Waste rock excavated from mines and quarries. Includes angular boulders, cobbles, and pebbles, and sand consisting of marble (in the Ogdensburg-Franklin area) and gneiss (at Edison) with some cinders and slag. As much as 20 feet thick. ALLUVIUM--Silt, sand, clay, and pebble-to-cobble gravel. ontains variable amounts of organic matter. Color of matrix

Small areas of fill in urban areas are not mapped.

sediment is gray, brown, and yellowish brown. As much as 10 feet thick (estimated). Silt, sand, and clay are deposited as overbank material on the floodplain and occur chiefly along low-gradient stream reaches. Gravel and sand are deposited in the stream channels and occur chiefly along higher-gradient stream reaches. Sand and gravel composition is similar to that of glacial deposits in the drainage basin.

SWAMP DEPOSITS--Gray silt and clay overlain by darkbrown to black peat. May be overlain or replaced by finegrained alluvium in places along larger streams (for example, in the Wallkill valley south of Ogdensburg). As much as 20 feet thick (Waksman and others, 1943, p. 148). Glacial lakebottom deposits of silt, clay, and fine sand may underlie the swamp deposits in places, particularly in large swamps. TALUS--Angular boulders and blocks of rock, with little or no matrix material, forming steep aprons at the base of cliffs.

Includes a small deposit of gray gneiss talus on Bowling Green Mountain, and purple to red quartzite talus on Green Pond Mountain. Maximum thickness 20 feet (estimated). Many small talus deposits are not mapped. ALLUVIAL FAN DEPOSITS--Cobble-to-boulder gravel, sand, minor silt. Color of matrix is brown to yellowish brown. Form fan-shaped deposits at the mouths of ravines eroded into thick glacial sediments, or at the mouths of steep stream

reaches. As much as 40 feet thick (estimated). Sand and gravel composition similar to that of the glacial deposits in the drainage area. STREAM TERRACE DEPOSITS--Sand, silt, and pebble gravel, minor cobble gravel. Color of matrix is brown to yellowish brown. Forms terraces 5 to 10 feet above the

present floodplain. As much as 15 feet thick. Sand and gravel

composition similar to that of the glacial deposits in the Glacial Deposits--These include stratified glacial-lake and glacial-stream deposits, and till. They were deposited during the late Wisconsinan glaciation The orientation of striations and drumlins, and the distribution of erratics, indi-

cate that the glacier advanced in a generally southerly direction across the map area. Southwesterly striations in the Wallkill and Rockaway valleys, if they were made during advance, indicate some channelling of ice flow along the valley bottom while ice on uplands was flowing to the south. Late Wisconsinan ice advanced as far as about 8 miles south of the southern edge of the quadrangle. During its advance the glacier deposited till in drum-

lins, in continuous sheets on hillslopes facing the advancing ice (north- or northwest-facing slopes), and, in places, atop belts of weathered bedrock. The veathered rock includes sandy and clayey saprolite on gneiss; and clayey, silty residuum on carbonate rock and shale. It is as much as 100 feet thick on gneiss (wells 152, 161, 180, 206, 243, and 245), and may be as much as 500 feet thick in local pockets on carbonate rock in the Wallkill valley (based on borings drilled in 1900 and 1901 and reported in N. J. Geological Survey permanent notes 22-32-269, 22-22-979), although it is generally less than 200 feet thick (wells 28, 52, 62, 82, 132, 145, 232) on carbonate rock and shale elsewhere. Weathered carbonate rock may include some collapsed glacial sediment. In a few places, for example, in the Sparta Glen area, stratified sediment laid down in front of the advancing ice was overridden and erosional remnants of the stratified sediment were covered by till (see well logs 198, 199, 200, 230-233, 240). Remnants of weathered, oxidized till of Illinoian age may also be preserved beneath late Wisconsinan till in places (for example, well 51). Although weathered till has not been observed in the Franklin quadrangle, it was exposed in two excavations in drumlins in the vicinity of Franklin just north of the

In other areas till deposition was discontinuous and the glacier eroded bedrock. Erosional features include scoured troughs in weathered carbonate rock in the Wallkill and Wildcat Brook valleys, and in shale in the Rockaway valley. Glacial erosion also formed extensive areas of abraded ledges (on slopes that faced toward advancing ice) and quarried cliffs (on slopes that faced away from advancing ice) on resistant gneiss and quartzite rock on the Pimple Hills and on Sparta, Hamburg, Bowling Green, and Green Pond mountains.

Late Wisconsinan ice began to melt back from its terminal position approximately 20,000 years ago. As the ice front retreated northward, glacial lakes formed in valleys that sloped toward the glacier, and were thus dammed, or in valleys that sloped away from the glacier but were dammed by previously-deposited glacial sediment. Valleys that were not dammed conducted streams of glacial meltwater. In places, till and debris-flow sediment were deposited in small moraines along the ice margin, or accumulated in areas of stagnant ice isolated from the main glacier. The ice-contact slopes of stratified deposits, and the trend of moraines, permit an approximate determination of the orientation of recessional ice margins. In the quadrangle these reconstructed ice margins (fig. 1) trend roughly east-west. Topographically-induced lobation probably was slight on uplands, but more pronounced along the walls of the Wallkill and Rockaway valleys. Details of the glacial lake levels and spillways are provided in the map-unit descriptions.

Glacial-Lake Deposits--These are stratified and generally well-sorted. The include sand and gravel deposited in deltas and lacustrine fans, and clay, silt and fine sand deposited on lake-bottom plains and in the lower parts of deltas Bedding in the deltas includes inclined foreset beds of sand, pebbly sand, and ninor pebble-to-cobble gravel, overlain at the surface by thin, horizontal topset beds of sand and pebble-to-cobble gravel. Lacustrine fans contain gently-dip ping beds of sand, pebble gravel, and cobble gravel. Bedding in both deltas and custrine fans may be deformed locally by collapse, slumping, or pushing by glacial ice. Bedding in lake-bottom deposits is generally horizontal, laminated o thin-bedded, and undeformed. Color of non-gravel sediment is very pale brown to light gray. Sand composition is chiefly quartz, feldspar, and frag nents of gneiss, carbonate rock, sandstone, mudstone, and quartzite, with variable but minor amounts of mica and heavy minerals. Gravel is composed thiefly of clasts of local bedrock or clasts eroded from the local till. Gravel in the Glacial Lake North Church and Sparta Valley deposits consists chiefly of carbonate rock and gneiss; with lesser gray to brown sandstone, slate, quartzite, conglomerate, and gray to black chert. Gravel in the Stockholm, Tamarack, unnamed, and uncorrelated deposits consists chiefly of gneiss; with minor gray to brown slate, sandstone, quartzite, chert, and carbonate rock. Gravel in the Bowling Green, Berkshire Valley, and ice-contact deposits is chiefly gneiss, gray to brown slate and sandstone, and purple to red quartzite and conglomer-

ite; with minor red mudstone, gray quartzite and chert.

GLACIAL LAKE NORTH CHURCH DEPOSITS--Deltaic (Qnc), lacustrine-fan (Qncf), and lake-bottom (Qncl) sediment deposited in glacial Lake North Church. Lake North Church (Salisbury, 1902) occupied part of the northdraining Wallkill valley. It was controlled by a spillway across the Germany Flats outwash surface near White Lake in the Newton East quadrangle, about 4 miles southwest of Franklin. Kettle lakes at this location indicate that stagnant ice was present, and as it melted the spillway lowered. Three successively lower erosional channels cut into the outwash surface downstream from the spillway indicate that it fell from about 620 to 600 feet in elevation (Witte, 1991). Most of the deposits in the Franklin quadrangle were deposited in the earlier, higher lake stages. Eventually, Lake North Church lowered to 590 feet, then to 550 feet, as the retreating ice front uncovered lower, west-draining spillways to the north of the Franklin quadrangle. These lower lakes extended nto the Franklin quadrangle in the lowest parts of the Wallkill valley north of gdensburg. Continued retreat of the ice front north of the junction of the Wallkill and Papakating valleys, about 7 miles north of Franklin, opened drain age into the Papakating valley. This allowed lake levels in the Wallkill valley to drop to the level of the lake occupying the Papakating valley. This lake had a spillway elevation of about 500 feet and most likely did not extend into the Franklin quadrangle.

Sand, pebble gravel, minor silt--As much as 40 feet thick. The two deposits in the Franklin quadrangle are non-icemarginal deltas that were fed from ice margins on uplands Sand and gravel--As much as 100 feet thick (estimated).

Silt, clay, fine sand-As much as 80 feet thick.

SPARTA VALLEY DEPOSITS--Deltaic (Qsv7, Qsv6, Qsvu), lacustrine-fan (Qsvf), and lake-bottom (Qsvl) sediment deposited in glacial Lake Sparta Units Qsv1 through Qsv5 are in the Newton East quadrangle (Witte, 1991). Lake Sparta (Witte, 1991) occupied the north-draining Wallkill valley south of ranklin. The deposits in the Franklin quadrangle were laid down in a stage of the lake controlled by a spillway at an elevation of about 650 feet near Sparta Station in the Newton East quadrangle, about 3 miles southwest of Ogdensburg. This spillway drained westward to the Paulins Kill valley. Lake Sparta lowered to the level of Lake North Church when the retreating ice front ncovered the north end of the Pimple Hills, just south of Franklin.

Sand, pebble gravel, and cobble gravel--As much as 100 feet thick. At Ogdensburg, the delta consists of cobble gravel and cobble-to-pebble-gravel topset beds as much as 8 feet thick overlying fine sand to cobble-to-pebble-gravel foreset beds. The part of this deposit north of the Ogdensburg Culvers Gap Moraine ridge (unit Qkocg) probably wa deposited after the main part of the deposit south of the moraine. In the ice-contact part of Qsv7 on the west side of generally less than 6 feet thick, interbedded with the forese beds. The Qsv7 delta south of Franklin Pond is as much as 50 feet thick (estimated) and was likely fed by meltwater descending the Franklin Pond Creek valley. It was probably deposited slightly later than the Ogdensburg delta.

Sand and cobble-to-pebble gravel--Cobble-to-pebble-gravel topset beds generally less than 6 feet thick overlie sand and pebble gravel foreset beds as much as 60 feet thick (estimated). Debris-flow deposits, generally less than 6 fee thick are interbedded with foreset beds in ice-contact parts of the deposits. The Qsv6 delta on the west side of the Wallkill valley was fed in part, by meltwater draining from the sma valley in the Pimple Hills to the north. Parts of the delta on the east side of the valley may have been deposited by meltwater descending ice-marginal channels along the valley wall to the northeast. Sand and pebble-to-cobble gravel--As much as 50 feet thick

estimated). Uncorrelated to major ice-margin positions. Sand and gravel--As much as 20 feet thick. In subsurface Silt, clay, fine sand--As much as 100 feet thick. Uppermost part may include some postglacial lake-bottom sediment. STOCKHOLM DEPOSITS--Deltaic sediment (Osh3, Osh2, Osh1) deposited

in three stages of a glacial lake occupying a north-draining valley south and

west of Stockholm. Lake-bottom deposits are not exposed but probably underlie swamp deposits that cover the former lake floor. Sand and pebble gravel--Includes silt and fine sand in places in the subsurface (well 164). As much as 80 feet thick. pillway drained eastward into the Pequannock valley at an elevation of about 1000 feet.

Sand and pebble gravel-As much as 50 feet thick timated). Spillway drained eastward into the Pequannock valley at an elevation of about 1100 feet. Sand and pebble-to-cobble gravel--As much as 50 feet thick stimated). Spillway drained southward into the Russia

Brook valley at an elevation of about 1150 feet.

TAMARACK DEPOSITS--Deltaic sediment (Qtr3, Qtr2, Qtr1) deposited in three separate glacial lakes in valleys south of Tamarack Lake. Lake-bottom deposits are not exposed but probably underlie swamp deposits that cover parts of the former lake floors.

Sand and pebble gravel--As much as 20 feet thick stimated). Deposited in a small lake occupying a north draining valley. Spillway drained south at an elevation of bout 1070 feet into the lowest stage of Lake Stockholm. Sand and pebble-to-cobble gravel--As much as 20 feet thick

stimated). Deposited in a lake occupying a valley that was lammed by till. Spillway drained south across the till dam at in elevation of about 1130 feet into the Russia Brook valley. Sand and pebble-to-cobble gravel--As much as 15 feet thick estimated). Deposited in a small lake occupying a north fraining valley. Spillway drained southward at an elevation

of about 1250 feet into the Russia Brook valley. UNNAMED DEPOSITS X--Deltaic sediment (Qx3, Qx2, Qx1) deposited in three stages of a glacial lake occupying a north-draining valley southeast of

Sand and pebble-to-cobble gravel--As much as 20 feet thick stimated). Spillway drained eastward at an elevation of about 1140 feet into the low stage of unnamed lake Y. Sand and pebble gravel--As much as 40 feet thick stimated). Spillway drained eastward at an elevation of bout 1190 feet into the high stage of unnamed lake Y.

Sand and pebble-to-cobble gravel--As much as 20 feet thick estimated). Spillway drained southward at an elevation of bout 1210 feet into the Pequannock valley. UNNAMED DEPOSIT Y -- Deltaic sediment (Qy1) deposited in the high stage of a glacial lake occupying a north-draining valley north of Oak Ridge Reser-

voir. Deposits of the low stage of this lake (Qy2) are in the Newfoundland Sand and pebble-to-cobble gravel--As much as 30 feet thick estimated). Spillway drained southward at an elevation of

about 1090 feet into the Pequannock valley. BERKSHIRE VALLEY DEPOSITS--Fluvial and deltaic (Qbv5, Qbv4) lacustrine-fan (Qbvf), and lake-bottom (Qbvl) sediment deposited in glacial lakes and fluvial plains in Berkshire Valley (the local name for the large valley in the southeast corner of the quadrangle). Berkshire Valley is a south-draining valley that was dammed by successive ice-marginal deposits. As these sed ment dams were eroded, the lake levels lowered. As sediment gradually filled the lake basins, and as the lake levels lowered, the lake bottom became exposed and fluvial deposits were laid down over the lacustrine deposits. Units Obv1 Qbv2, and Qbv3 are in the Dover quadrangle (Stanford, 1989); unit Qbv6 is in the Newfoundland quadrangle (Stanford, 1991). When the retreating ice front uncovered the Pequannock valley near Newfoundland (about 4 miles northeast of Moosepac Pond), all meltwater was diverted eastward down the Pequannock valley and deposition of the Berkshire Valley deposits ended.

Sand, pebble gravel, some pebble-to-cobble gravel--As much as 80 feet thick. These are chiefly collapsed deltaic deposits laid down in lakes ponded by the head of Qbv4, but the unit includes thin fluvial terrace deposits inset into Qbv4

at Lake Swannanoa. Cobble-to-boulder gravel, some pebble-to-cobble gravel werlying sand and pebble gravel--As much as 80 feet thick. Grades downward into unit Qbvl, except in the Russia Brook valley between Milton and Lake Swannanoa, where i overlies unit Qn. Qbv4 is a fluvial and deltaic unit that was deposited from an ice margin position extending from Russia to Moosepac Pond. The eastern arm of the deposit was laid down in a lake dammed by the head of unit Obv3 at Woodstock in the Dover quadrangle, just south of the quadrangle boundary (Stanford, 1989); the western arm of the deposit north of Milton was laid down in a lake occupying a part of the Russia Brook valley dammed by till at Milton. In both cases the lakes were filled with lacustrine sediment.

extended through the former spillways. Silt, fine sand, clay--As much as 110 feet thick. Includes lake-bottom and lower deltaic foreset deposits. Sand and gravel--As much as 50 feet thick. In subsurface only (sections CC', DD').

Fluvial deposits aggraded atop the lacustrine sediment and

BOWLING GREEN DEPOSITS--Deltaic and ice-contact sediment (Qbg3 Qbg2, Qbg1) deposited in three stages of a glacial lake occupying the north east-draining valley west of Milton. This lake drained when the retreating ice front unblocked the Russia Brook valley between Milton and Lake Swannanoa. Sand and pebble-to-cobble gravel, some boulder gravel

and diamicton--As much as 100 feet thick (estimated) Spillway drained eastward at an elevation of about 980 feet into the Rockaway valley. Sand and pebble-to-cobble gravel, some boulder gravel and diamicton--As much as 100 feet thick (estimated) Spillway drained eastward at an elevation of about 1120 feet into the Rockaway valley.

Sand and cobble-to-boulder gravel and diamicton--As much as 20 feet thick (estimated). Spillway drained southward at an elevation of about 1170 feet into the Weldon ICE-CONTACT DEPOSITS--Sand and gravel, probably with some interbedded diamicton. As much as 60 feet thick.

Deposited in ice-walled basins near Moosepac Pond. UNCORRELATED LAKE-BOTTOM DEPOSIT--Silv clay, minor fine sand. As much as 15 feet thick (estimated) Deposited in a ponded reach of the Pequannock valley north of Stockholm that was dammed by till at its south end; may be partly postglacial.

UNCORRELATED DELTAIC DEPOSITS--Sand and pebble-to-cobble gravel, some boulder gravel. As much as 40 feet thick (estimated). Laid down in small ice-dammed ponds in upland valleys. Possible relations of these deposits to recessional ice margins are shown in figure 1.

Glacial-Stream Deposits--Stratified, generally well-sorted gravel and sand forming valley-bottom plains, terraces, and fans in valleys not occupied by gla cial lakes. Bedding is generally horizontal; with massive, thick beds in cobble to-boulder gravel; and cross-beds, to thin, plane beds in sand to pebbly sand. Color of non-gravel sediment is very pale brown, brown, and light gray. Sand is chiefly quartz, feldspar, and fragments of gneiss, sandstone, slate, and quartzite; with minor amounts of mica and heavy minerals. Gravel is chiefly gneiss; with some gray to brown sandstone, slate, quartzite, and conglomerate. MELTWATER FAN DEPOSITS--Cobble-to-boulder gravel and sand. In fan-shaped deposits at mouths of

meltwater channels. As much as 20 feet thick (estimated). The two small deposits northeast of Ogdensburg were deposited in small ice-walled basins abutting the valley wall, about 40 feet above the level of Lake Sparta. PEQUANNOCK OUTWASH--Pebble-to-cobble gravel. sand, and some boulder gravel. As much as 30 feet thick

PACACK OUTWASH--Pebble-to-cobble gravel and sand. As much as 20 feet thick (estimated). Till and Related Deposits--Poorly sorted, nonstratified sediment deposited by glacial ice or by flow of sediment from the glacier surface. Occur in drumlins and moraines, as a discontinuous layer on the bedrock surface, and in areas of hummocky stagnant-ice topography.

brown (oxidized) to light-gray and brownish-gra (unoxidized) silty sand to sand with many (10 to 40% b Depth of oxidation ranges from 5 to 15 feet. Till matrix i glomerate. The gneiss clasts are from the local bedrock; the scattered carbonate rock, quartzite, and conglomerate that become increasingly scarce with distance southeast from the ate. This material is eroded from the Green Pond Formation which crops out on those mountains. On the east side o many red shale clasts. This facies of unit Qn was formed by the incorporation of weathered red shale of the Longwood base of Green Pond Mountain (Herman and Mitchell, 1991).

NETCONG TILL, UPLAND BASIN PHASE--Netcong til as above, but matrix is generally sandier and less compac and gravel and boulders are more abundant. As much as 40 feet thick (estimated). Forms low ridge, knoll, and basin topography in the bottoms of valleys in upland areas, or indistinct terraced landforms on hillslopes. Topographi features lack preferred orientation or alignment, and the deposits lack clear linear continuity across intervening ridges They are interpreted as mostly superglacial till deposited from masses of stagnant ice isolated from the main glacier in upland valleys. However, some may have been laid down along active recessional margins of the main glacier (fo

example, at southernmost ice margin in figure 1). NETCONG TILL OF THE SILVER LAKE MORAINEletcong till as in Qn forming a discontinuous belt of arcuate ridges, low knolls, and shallow basins extending from Silver Lake to the vicinity of Beaver Lake crossroads. As much as 40 feet thick (estimated). The two segments of the moraine north of Beaver Lake crossroads have continuous ridges with gentle north slopes and steeper south slopes (shown by a special symbol on the map). Their asymmetry suggests emplacement by active ice. Similar, smaller asymmetric ridges occur in the two segments of the moraine at Silver

> This moraine is the probable eastward extension of the gdensburg-Culvers Gap Moraine. Herpers (1961) described andforms and exposures of till between Stockholm and gdensburg that he considered to be the eastward extension of the Ogdensburg-Culvers Gap Moraine. These features are south of the Silver Lake Moraine and are either exposures of nonmorainal till, or are pseudomorainic rock-cored

brown (oxidized) to grayish-brown and light olive-brown (unoxidized) sandy silt to silt with some to many subrounded to subangular pebbles and cobbles and few (0 to 5% by volume) to some subrounded boulders. Depth of oxidation anges from 5 to 15 feet. Till matrix is generally compact, slightly plastic, slightly sticky, nonjointed, with moderately developed subhorizontal fissility. Gravel includes chiefly gray-to-white dolomite and marble, and gray slate and sandstone, some gneiss, and minor white-to-gray quartzite and conglomerate. Dolomite and marble and, in a few places, gneiss, are the local bedrock; the other clasts are derived from bedrock to the north of the map area in the Wallkill valley (slate and sandstone) and on Shawangunk Mountain (quartz ite and conglomerate) and Pochuck Mountain (gneiss). Boulders are chiefly dolomite and gneiss, with some marble quartzite, and conglomerate. Unit Qk is as much as 100 feet thick (estimated) in drumlins and till ramps but is generally less than 40 feet thick elsewhere. Unit Qkt delineates areas of scattered bedrock outcrop where till is discontinuous and generally less than 20 feet thick. Contacts with units Qn and

KITTATINNY TILL OF THE OGDENSBURG CULVERS GAP MORAINE--Kittatinny till as in unit Qk westward across Kittatinny Valley to Culvers Gap (Salisbury 1902; Herpers, 1961), and, beyond, across Kittatinn 1961; Witte, 1991).

MAP SYMBOLS - Contact--Dotted where concealed by fill or water or exposed by excavation. Contacts of postglacial deposits, stratified glacial deposits, and moraines generally are sharp and well-defined by landforms. Contacts between units Qk, Qkt, Qn, Qnu, Qnt, and bedrock outcrop areas ("r") generally are gradational or featheredged. Area of extensive bedrock outcrop--Surficial sediment generally absent. Some outcrops in the Ogdensburg-Franklin area are based on unpublished maps of the New Jersey Zinc Company (on file at the N. J. Striation-Observation at dot. Arrow shows inferred direction of glacier Drumlin--Line along crest, symbol at summit. Till ridge--Line along crest, barbs on ice-contact slope. Formed along recessional ice margins. Meltwater channel--Line in channel bottom, arrow shows inferred flow Spillway for glacial lake-Symbol in spillway area. Arrow shows drainage direction, lettering indicates associated deposit. Queried where - - - Scarp cut by postglacial streams--Line at top of scarp, blocks on slope. Scarp cut by meltwater--Line at top of scarp, ticks on slope. Limit of excavated area-Line at edge of area, ticks within area. Contacts within large excavations show the approximate location of map units within the excavation at the time of mapping. In places, excavation has altered the topography substantially from that on the base map. Sand and gravel pit--Active in 1993. Sand and gravel pit--Inactive in 1993. Surface accumulation of boulders--Till surfaces washed by meltwater. Does not include talus. (Qa)) / Qpq Thin unit--Unit in parentheses is thin, patchy, and overlies unit to right of ▲ Exposure of stratified deposits beneath till--Exposed in 1993 in Sparta 47 • Well or boring with log in table 1--Location judged to be accurate to 147 0 Well or boring with log in table 1--Location judged to be accurate to 83 a Depth to bedrock--In test boring or based on seismic traverse. Test boring data from N. J. Geological Survey permanent notes; seismic data from David Hall and Thomas Bambrick (N. J. Geological Survey, written communication, 1986). Elevation of bedrock surface--Contour interval 50 feet. Shown only where depth to rock generally exceeds 20 feet.

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recessional ice margin,

dashed where inferred

lettering indicates

associated deposit

Green Pond Mountain region from Dover to Greenwood Lake, New

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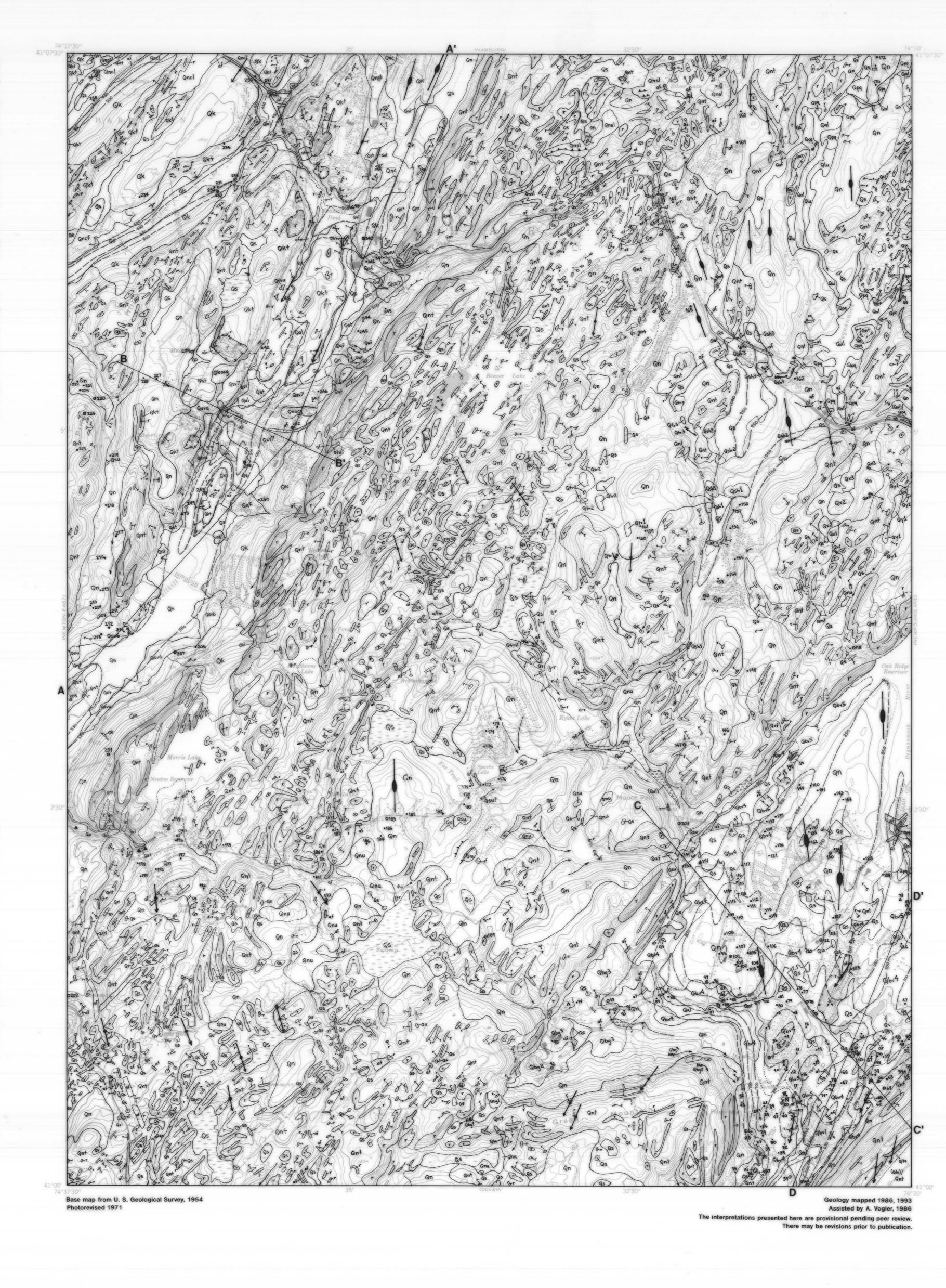
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NETCONG TILL--Yellow, yellowish-brown, very pale volume) subrounded to subangular pebbles and cobbles, and some (5 to 10% by volume) to many subrounded boulders. generally compact, nonplastic, nonsticky, nonjointed, but may have a weak to moderate subhorizontal fissility. Gravel s chiefly gneiss, some gray slate and sandstone, and a trace of gray carbonate rock and white-to-gray quartzite and conother clasts are derived from bedrock in the Wallkill valley, in Berkshire Valley, and on Shawangunk Mountain to the north of the quadrangle. Boulders are chiefly gneiss, with some Wallkill valley. On, and south of, Bowling Green Mountain, and on Green Pond Mountain, the till contains some to many gravel clasts and boulders of purple quartzite and conglomer Berkshire Valley, and on Green Pond Mountain, the til matrix is a reddish-yellow, silty sand and, in places, sandy silt or sandy clayey silt, and the gravel fraction contains some to formation, which crops out in a narrow belt along the west Unit Qn is as much as 100 feet thick in drumlins and till sheets but is generally less than 40 feet thick elsewhere. Uni-Int delineates areas of scattered bedrock outcrop where the till is discontinuous and generally less than 20 feet thick. Contacts with units Qk and Qkt are gradational.

KITTATINNY TILL--Very pale-brown and yellowish-

forming a low ridge along the ice-contact part of the Qsv7 delta at Ogdensburg, and low knoll-and-basin topography on the west side of the Wallkill valley, at Ogdensburg. As much as 40 feet thick (estimated). These are the easternmost segments of a prominent recessional moraine that extends Mountain to Dingmans Ferry in the Delaware valley (Minard,



VERTICAL EXAGGERATION X5

moraine deposits

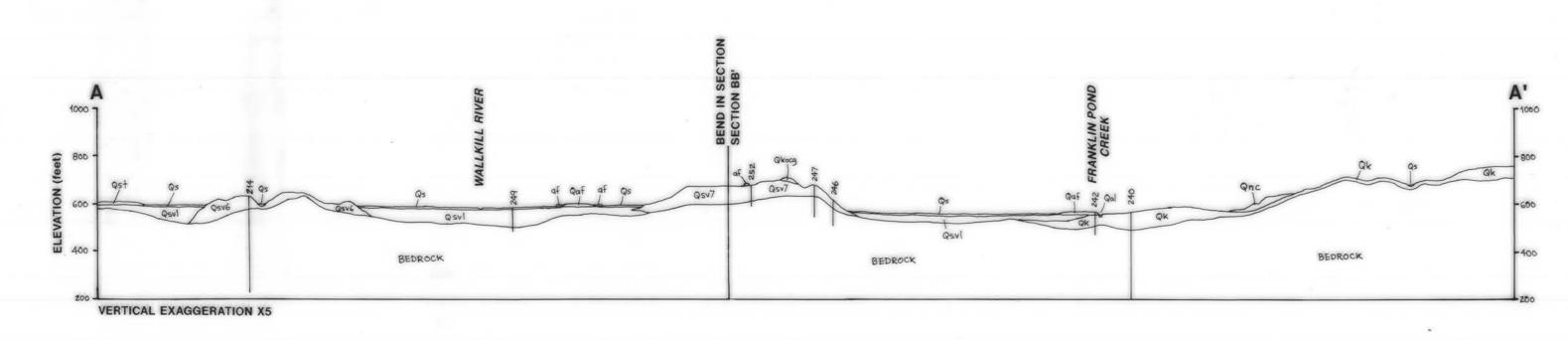
stagnant ice deposits

lake-bottom deposits

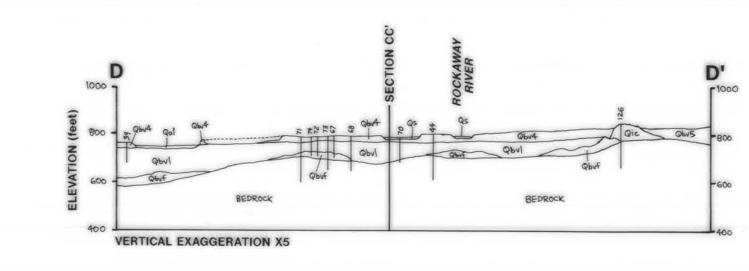
deltaic and fluvial deposits

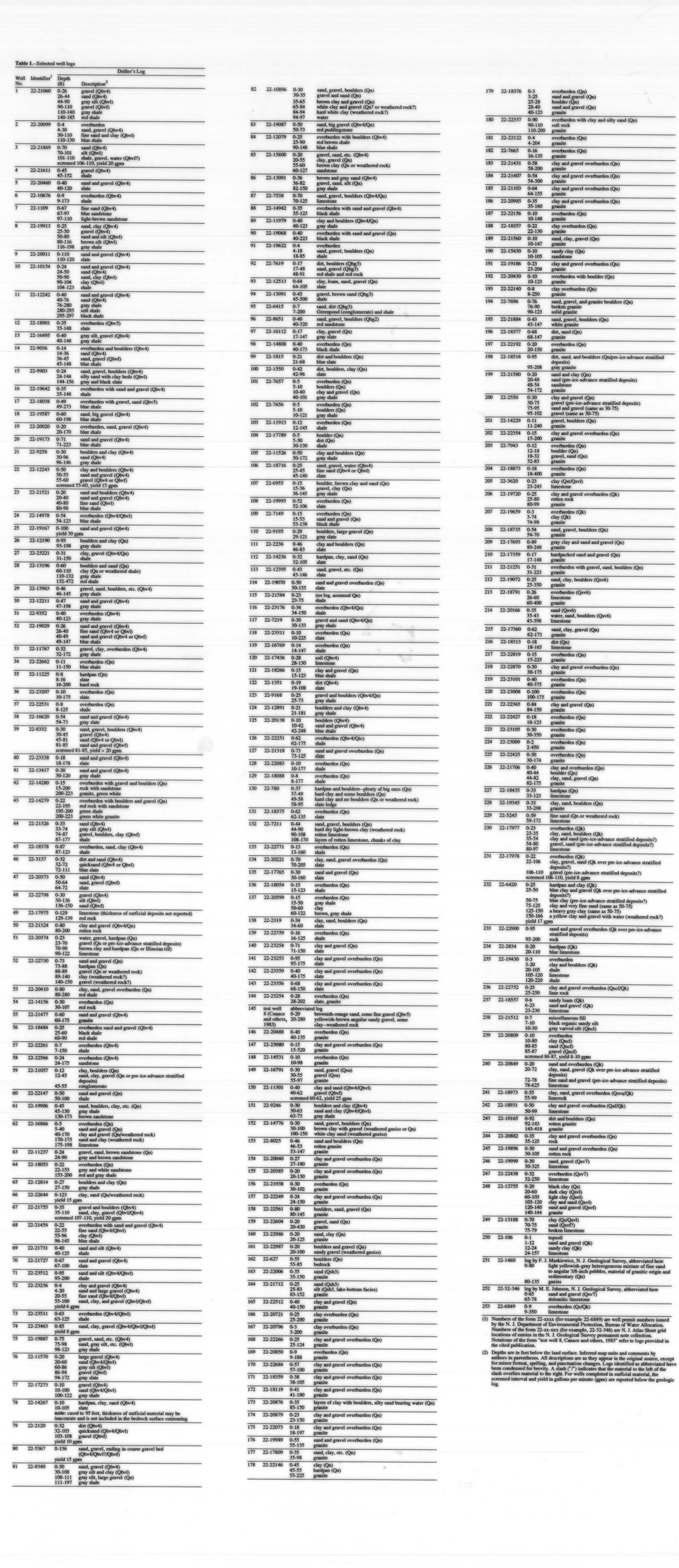
Figure 1.--Recessional deposits and ice margins in the Franklin quadrangle.

SURFICIAL GEOLOGY OF THE FRANKLIN QUADRANGLE, SUSSEX, MORRIS, AND PASSAIC COUNTIES, NEW JERSEY



BEDROCK **VERTICAL EXAGGERATION X5**





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